

of gold or silver in a ton of ore—or in round numbers, about one part in sixty thousand—may be readily detected by the blowpipe.*

During cupellation, the process sometimes becomes suddenly arrested. This may arise from the temperature being too low, in which case the point of the blue flame must be brought for an instant on the surface of the globule, until complete fusion again ensue. Or, the hindrance may arise from the bone ash becoming saturated, when a fresh cupel must be taken. Or, it may be occasioned, especially if much copper or nickel be present, by an insufficient quantity of lead. In this latter case, a piece of pure lead must be placed in contact with the globule, and the two fused together; the cupel being then moved backward from the flame, and the oxidating process again established.

(10) *Fusion with Reagents in Platinum Spoon.*—This operation is only required in certain special cases, as in the examination of a substance suspected to be a tungstate or molybdate, or in searching for the presence of titanate acid, &c. The substance, in fine powder, is mixed with three or four parts of the reagent (carb. soda, or bisulphate of potash, &c.), and the mixture, in successive portions, is fused in a small platinum spoon. As a rule, the flame may be made to impinge upon the bottom of the spoon; and the operation is terminated when bubbles cease to be given off and the mixture enters into



FIG. 12.

quiet fusion. During the operation the spoon is held in the spring-forceps (Fig. 12), the points of which remain in close contact when the sides are not subjected to pressure. The fusion accomplished, the



FIG. 13.

spoon is dropped, bottom upwards, into a small porcelain capsule (Fig. 13) provided with a handle. Some distilled water is then added and brought to the boiling point over the spirit-lamp. The fused mass quickly separates from the spoon, and it can then be crushed to powder and again warmed until

* A cupellation bead may appear from its pure white colour to consist of silver only, and may yet contain a notable amount of gold. A white bead, therefore, should be flattened into a disc, and fused with some bisulphate of potash in a small platinum spoon. By this treatment the silver is removed from the surface of the disc, and the latter, if gold be present, assumes a yellow colour. If the metal be again fused into a globule, the white colour is restored.

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